# THE RELATIONSHIP BETWEEN MATERNAL PLASMA ENDORPHIN AND PROLACTIN LEVELS DURING LABOR

P. Riss, Ch. Bieglmayer

Both immunoreactive endorphin peptides (ir-EP) and prolactin (PRL) are known to be secreted in response to various stressful stimuli. Available evidence also suggests that endorphins may cause the release of prolactin (2). We therefore set out to investigate the relationship between maternal plasma ir-EP and PRL levels during labor and following delivery.

In 40 healthy patients during spontaneous or induced labor blood was collected in early labor (cervical dilatation 1-5cm), late labor (6-8cm), during the second stage, at delivery, and 1 and 3 hours post partum. Blood was collected in EDTA coated tubes on ice, centrifuged at 2500g for 10 minutes, and stored at -20 degrees until assay. ir-EP and prolactin were determined without prior extraction using RIA kits from New England Nuclear for beta-endorphin and from Pharmacia for prolactin respectively. To exclude the influence of suckling on hormone levels post partum infants were not nursed during the first 3 hours after delivery.

ir-EP levels in maternal plasma increased during labor, peaked at delivery, and returned to initial levels 1 hours post partum. In contrast prolactin remained constant or dropped slightly during labor and at delivery, but increased significantly immediately after delivery (Fig.1).

In order to investigate a possible causal relationship between the ir-EP levels at delivery and the prolactin levels one hour post partum we determined the correlation coefficient between the 2 groups. However, we found no significant relationship between ir-EP at delivery and prolactin post partum.

While there is an almost 10fold rise in maternal prolactin during gestation, maternal prolactin actually decreases during labor, reaches the lowest value at delivery, and rises rapidly in the immediate postpartum period (3). While our data confirm these observations an explanation for the apparently paradoxical absence of a stress related rise in PRL is still missing. Rigg and Yen (3) conclude that PRL secretion in the pregnant patient at term is unresponsive to the usual stimuli and postulate that a transient increase in tuberoinfundibular dopaminergic activity during active labor could

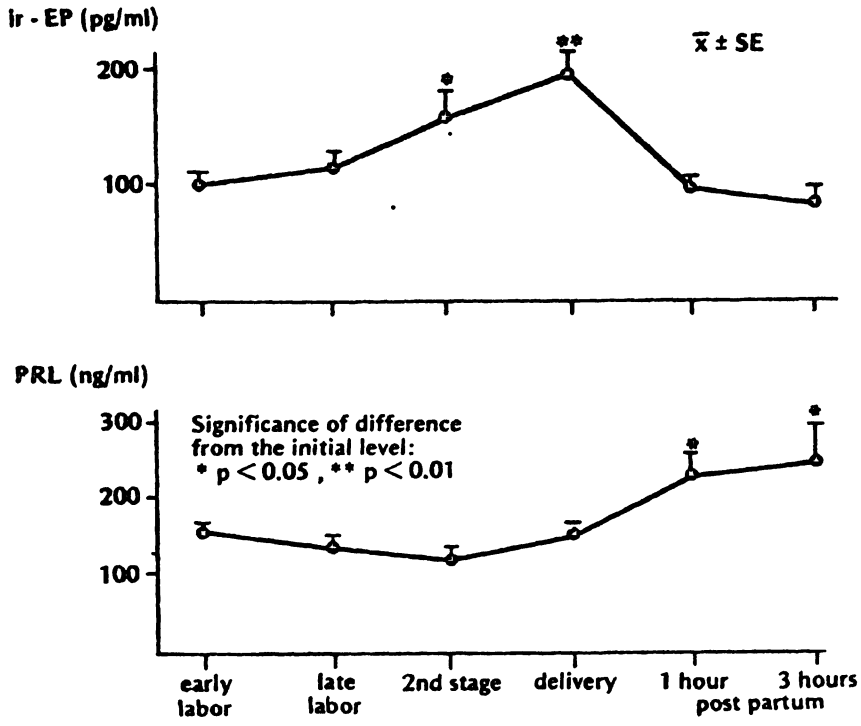


Figure 1: immunoreactive endorphin peptides (ir-EP) and prolactin (PRL) in maternal plasma

---

explain the observed changes in PRL levels during and following labor.

One mechanism by which endorphins could release PRL is by decreasing the release of dopamine into the portal blood, possibly through activation of specific opiate receptors on tuberoinfundibular dopaminergic neurons (1). However, the mechanism could be considerably more complicated since many other factors influence PRL secretion.

References

(1) Gudelsky GA, Porter JC: Morphine- and opioid peptide-induced inhibition of the release of dopamine from tuberoinfundibular neurons. Life Sci. 25:1697, 1979
(2) Oyama T, Yamaya R, Jin T, Kudo T: Effect of exogenous beta-endorphin on anterior pituitary hormone secretion in man. Acta.Endocrinol. 99:9,1982 (3) Rigg LA, Yen SSC:Multiphasic prolactin secretion during parturition in human subjects.Am.J.Obstet.Gynecol.128:215,1977

Adress: Dr. Paul Riss, 2. Frauenklinik, A-1090 Wien